TECHNICAL REVIEW FOR PERMIT #1000170
(El Paso Natural Gas Company, Flagstaff Compressor Station)

General Comments

El Paso Natural Gas Company (EPNG) provides natural gas transportation services for natural gas suppliers and end users throughout the southwestern United states. EPNG owns and operates a large pipeline network for which the Flagstaff Compressor Station serves as one of the gas compression locations. Compression is needed to maintain enough pressure in the pipeline to keep the gas flowing

The Flagstaff station operates two reciprocating engines to drive the compression units. The reciprocating engines are powered by the combustion of natural gas. The reciprocating engine stacks are the primary sources of air pollutant emissions. The primary pollutant present in the stack gases resulting from combustion of natural gas is NOx. Formaldehyde, SO_2, CO, and VOCs are other pollutants present in the stack gases. Other equipment on site is comprised mainly of valves, compressor seals, connections and associated piping, and emissions from these units are mainly trace amounts of VOCs.

Regulatory History

The engines were installed in 1964/1966. EPNG planned to install two additional GE Frame 3 turbines, and submitted a PSD permit application in 1990. A significant amount of work was done on this permit, before it was withdrawn. In 1988 an application for an operating permit for the two reciprocating engines was submitted. The review was completed, and an operating permit #M50626P0-99 was drafted in 1995. The public notice, and public hearing stages were also completed. However, owing to some administrative mix-up the permit was never actually issued. The database (AZAIRS) indicates that the permit has been issued, but the source has never received the permit. A draft copy of the permit has the following conditions:

1. Performance tests on the two engines within 90 days of permit issuance. Pollutants to be tested for include NOx, CO, and THC.
2. Fuel limited to natural gas.
3. Opacity from reciprocating engines to be less than 40%.

There are no records of any test having been completed. There have been no reported violations of any air pollution laws by the source.

Emissions

The Title V application provides the following potential emission rates (from both engines):

NOx: 1168.38 tpy
CO: 159.32 tpy
VOC.: 45.68 tpy
SO_2: 0.22 tpy
Formaldehyde: 4.24 tpy

These emission rates were based on emission factors (e.g. AP-42), and 8760 hours of operation per year. They have also reported emission rates based on actual hours of operation in 1993 (from both engines):

NOx: 1074.36 tpy (actual hours = 8055)
CO: 146.5 tpy (actual hours = 8055)
VOC.: 42.0 tpy (actual hours = 8055)
SO_2: 0.2 tpy (actual hours = 8055)
Formaldehyde: 3.9 tpy (actual hours = 8055)

The emissions inventory (EI) for the year 1994, submitted to the Arizona Department of Environmental Quality (ADEQ) reported the following emissions:

Engine 1	Engine 2
NO_2: 555 tpy	NO_2: 555 tpy
CO: 71.7 tpy	CO: 71.7 tpy
SO_2: 0.09 tpy	SO_2: 0.09 tpy
VOC.: 22.4 tpy	VOC.: 22.4 tpy

The EI for the year 1995 reported the following emissions:

Engine 1	Engine 2
NO_2: 561.59 tpy	NO_2: 561.59 tpy
CO: 76.58 tpy	CO: 76.58 tpy
SO_2: 0.09 tpy	SO_2: 0.09 tpy
VOC.: 15.57 tpy	VOC.: 15.57 tpy

Permit Contents : Attachment B

The two reciprocating engines were manufactured in 1964/1966. The state rule that covers reciprocating engine operations is *R18-2-719 : Standards of performance for existing stationary rotating machinery*. This state rule considers emissions of three pollutants (I) particulate matter, (ii) visible emissions, and (iii) sulfur dioxide. There is no reference to NOx or CO emissions. Reciprocating engines are not affected facilities under *40 CFR 60, Subpart GG: New source Performance standards for Stationary Gas Turbines.* Therefore, the requirements of 40 CFR 60 Subpart GG are not applicable to the reciprocating engines at the Flagstaff station.

I. Emission Limits/Standards

A. Reciprocating Engines

1. Particulate Matter

Natural gas combustion results in small quantities of particulate matter emissions. The maximum potential particulate emissions from the reciprocating engines at the Flagstaff station were calculated to be 1.7 tpy. The emissions standard in R18-2-719.C imposes a particulate matter emissions limit of 73.5 tpy.

2. Sulfur

The operating permit requires EPNG to combust only natural gas for engine operations. The sulfur standard in R18-2-719.F refers to low sulfur fuel *oils*, therefore this standard is not applicable to natural gas combustion. R18-2-719.I and R18-2-719.J require recordkeeping and reporting requirements of fuel sulfur quantity. These requirements support the aforementioned sulfur standard, and as such are not applicable to natural gas combustion.

3. Visible emissions

The visible emissions standard, R18-2-719.E, imposes a 40% opacity limitation.

B. Non-point sources

The standards in Article 6 are applicable requirements for open areas and on-site vehicular traffic. The EPNG Flagstaff site is located in a remote area. EPNG sites typically have areas which are graveled, and other areas which are covered by natural vegetation. The Flagstaff site has minimum supervision, and as such there are seldom any continuous activities which are likely to disturb unpaved areas and cause visible emissions. The regulations in Article 6 are applicable requirements and are included in the permit.

EPNG has indicated in the application, that rare instances of open burning may occur. The condition in the permit directs EPNG to obtain a permit from ADEQ, or the local officer in charge of issuing burn permits.

C. Other Periodic Activities

1. Abrasive Blasting

EPNG has indicated in the permit application that there might be a few occasions in which abrasive blasting activities are conducted on-site. R18-2-726 and R18-2-702 (B) are applicable requirements, and are included in the permit.

2. Spray Painting

EPNG has indicated in the permit application that there might be a few occasions on which spray painting activities are conducted on-site. R18-2-727 and R18-2-702(B) are applicable requirements, and are included in the permit. R18-2-727(A) and R18-2-727(B) are included in the approved State Implementation Plan (SIP). R18-2-727(C) and R18-2-727(D) are also a part of the approved SIP. They are present in the definitions section of the SIP as R9-3-101.117. EPA approved SIP provision R9-3-527.C is not present in the amended rule. However, R9-3-527.C is an applicable requirement, and is federally enforceable until the current State SIP is approved by the EPA.

3. Mobile Sources

EPNG has indicated in the permit application that there might be a few occasions in which "mobile source" activities are conducted. "Mobile sources" refer to those sources covered by Article 8. R18-2-801, R18-2-802, and R18-2-804 are applicable requirements, and are included in the permit.

4. Demolition/Renovation

EPNG has indicated in the permit application that there might be a few occasions on which demolition/renovation activities may be conducted. In such instances, the requirements of 40 CFR 61, Subpart M (National Emissions Standards for Hazardous Air Pollutants - Asbestos) may be applicable.

5. Nonvehicle Air Conditioner Maintenance and/or Services

EPNG has indicated in the permit application that there might be a few occasions on which nonvehicle air conditioner maintenance activities may be conducted. In such instances, the requirements of 40 CFR 82, Subpart F (Protection of Stratospheric Ozone - Recycling and Emissions Reduction) may be applicable.

II. Monitoring and Recordkeeping Requirements

A. Reciprocating Engines

1. Particulate Matter

As noted in a preceding discussion (see Section I.A.1 of this document), natural gas combustion results in minimal particulate matter emissions. It was therefore decided that even though an emissions standard exists for particulate matter, it would be unnecessary and impractical to have a rigorous monitoring schedule for the particulate standard.

2. Sulfur

"Pipeline-quality" natural gas has to conform to standards approved by the Federal Energy Regulatory Commission (FERC). One of the FERC standards limits the sulfur content in the gas to less than 5 grains/100 scf (which is equivalent to 0.017 weight percent of sulfur). Another standard specifies that the heating value be greater than or equal to 967 Btu per cubic foot. EPNG runs the reciprocating engines with fuel drawn from their pipeline, and therefore it was decided that maintaining a copy of the relevant portions of the FERC approved Tariff agreement on-site would be an adequate means of complying with the monitoring requirements for the particulate and fuel use standards.

3. Visible Emissions

As in the case of particulate matter, visible emissions resulting from natural gas combustion are minimal. It was therefore decided that a rigorous monitoring schedule for opacity would not be required.

4. Operating schedule

The dates of engine operation are required to determine operating frequency of the engines. The operating frequency determines the testing schedule for the engines. After the performance tests are completed, it will not be required to record the dates of operation.

B. Non-point Sources

As discussed in the emissions limits section, the non-point source standards have been included in the permit because of the existence of applicable requirements. Section II.B lists a set of recordkeeping requirements, directing the source to keep a record of all the efforts taken towards mitigating visible emissions from non-point source activity. Also, monitoring requirements for the applicable open burning rule may be satisfied by keeping all open burn permits on file.

C. Other Periodic Activities

Other applicable rules are abrasive blasting, spray painting, "mobile source", demolition/renovation activities, and nonvehicle air conditioner maintenance. Monitoring requirements have been established in Section II.C of Attachment “B”.

III. Reporting Requirements

EPNG is required to report any changes in the FERC Tariff agreement related to lower heating value limits and sulfur content limits to ADEQ, within thirty days of such change.

At the time of submission of the semi-annual compliance certifications, EPNG is required to submit a report containing the dates on which each engine was operated. This information will assist ADEQ in tracking the operating frequency of the engines, and in ensuring compliance with the requirements of the testing section. This report may be discontinued after completion of the performance tests.

IV. Testing Requirements

There are no emission limits or standards for NOx, and CO. A performance test has not been completed on any of the engines at the Flagstaff Station. All emissions estimates thus far have been made based on emission factors. Considering these facts, ADEQ has concluded that a performance test would provide corroborating data to supplement the existing emission estimates. The Flagstaff station is operated on an intermittent basis. Fixing a specific time schedule may result in EPNG operating the engines solely for the purpose of complying with the requirements of the testing section. Therefore, the testing requirement does not have a fixed time schedule. It was decided to word the testing section language in such a way that EPNG would be required to test at the earliest instance when the Flagstaff station engines are operated beyond fifteen cumulative days during the course of the permit. While designing the aforementioned time schedule, ADEQ has kept in mind the fact that pipeline operating conditions fluctuate, and the engines may have to be fired on short notice. In order to be prepared to test

on short notice, it may be advisable for EPNG to submit any required test plans well in advance of any anticipated dates of engine operations.

List of Special Provisions

In their application, EPNG provided a list of special provisions that they wanted to be addressed in the permit. This list is located in Tab 1 of the application. They have been addressed in the following manner:
Maintenance and Inspection (Item 1), Emergency Shut Down Systems (Item 3), Cathodic protection system (Item 4), General Maintenance & Construction Activities (Item 6), Start-up, Shutdown & Maintenance (Item 8), Insignificant Activities (Item 9)
It was decided that each of these items qualified for classification as an insignificant activity, and as such was included in the list in Attachment "E".

Hazardous Air Pollutants (Item 2): Refer to Sections VI and X, Attachment "A".

Abrasive Blasting (Item 5): Abrasive blasting activities have an applicable requirement in the Arizona Administrative Code AAC). Also, according to the definition in AAC R18-2-101.54, for an activity to be classified as insignificant, it should not have *any* applicable requirement. All projects have to comply with the requirements of R18-2-726 and R18-2-702(B). Refer to Attachment B, I.C.1 and II.C.1.

Spray Painting (Item 7): A similar argument as in Item 5 above provides the reason for including R18-2-726 as an applicable requirement. Refer to I.C.2 and II.C.2.

Emissions Trading (Item 10): ADEQ has determined that EPNG should apply for a permit revision (if necessary) in case there are any changes in the permitted equipment.

Location of records (Item 11): Refer Section II.D, Attachment “B”.

Portable Sources (Item 12): Any contractor operating portable sources on site will need to obtain an air permit (if required) to cover the portable source operation. It was decided not to include this in the insignificant activities list as the portable equipment permits will be the responsibility of the contractors, and not of EPNG.

Air Conditioners (Item 13): Refer to Sections I.C.5 and II.C.5, Attachment "B".

Asbestos (Item 14): Refer to Sections I.C.4 and II.C.4, Attachment “B”.

Performance Tests (Item 15): Refer to Section IV, Attachment "B".